Space Weather Highlights
15 July - 21 July 2013

SWPC PRF 1977
22 July 2013

Solar activity was low. The largest events of the week were three C3/Sf events. The first two occurred at 15/0335 UTC and 15/1033 UTC, respectively, from Region 1791 (S14, L=255, class/area=Dso/110 on 15 July). Later in the week, Region 1800 (S08, L=158, class/area=Dao/80 on 21 Jul) produced the third C3/1f flare at 21/0844 UTC. Throughout the week, Region 1791 was responsible for the bulk of the flare activity while Regions 1793 (N21, L=195, class/area=Esi/310 on 16 Jul) and 1800 were the second and third most prolific flare producers. Regions 1791 and 1793 were the most magnetically complex regions on the visible disk; Region 1791 began the week with a beta-gamma-delta configuration which slowly devolved into a simple beta-type group before decaying to plage on 20 Jul. Region 1793 maintained its beta-gamma configuration throughout the week and was the largest region on the disk throughout the period. A potentially Earth-directed coronal mass ejection (CME) was observed in SOHO/LASCO C2 coronagraph imagery at 16/0400 UTC, leaving the southeast limb.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels every day this period, reaching a peak flux value of 4,330 pfu at 17/1850 UTC.

Geomagnetic field activity ranged from quiet to G1 (Minor) geomagnetic storm levels this week. Monday (15 Jul) began with G1 (Minor) geomagnetic storm conditions with major storm conditions observed at high latitudes due to effects from a CME that arrived on Sunday (14 Jul). By midday Monday, the geomagnetic activity had decreased to unsettled levels, and later declined to quiet levels by the end on 15 Jul. Quiet conditions persisted until Thursday (18 Jul) when a positive polarity coronal hole high speed stream (CH HSS) became geoeffective, bringing unsettled to active conditions which persisted through the first synoptic period on 20 Jul. The 16 Jul CME mentioned in the Solar Summary may have arrived in conjunction with the + CH HSS, contributing to the disturbed conditions, however, no CME signature was obvious in the ACE solar wind parameters.

Space Weather Outlook
22 July - 17 August 2013

Solar activity is expected to remain low with a chance for isolated R1 (Minor) radio blackout conditions throughout the period due to active region flare activity.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels through 02 Aug in response to a coronal hole high speed stream.

Geomagnetic field activity is expected to be at generally quiet to unsettled levels for the majority of the period, excluding a disruption for transient solar wind features. Active conditions are

expected from 26 - 28 Jul, 9 - 11 Aug, and 14 - 15 Aug in response to recurrent coronal hole high speed streams.

Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
15 July	114	77	360	B4.6	5	0	0	10	0	0	0	0
16 July	114	61	530	B3.7	2	0	0	3	0	0	0	0
17 July	111	74	430	B3.2	2	0	0	5	0	0	0	0
18 July	115	112	440	B3.4	2	0	0	0	0	0	0	0
19 July	114	94	330	B3.4	0	0	0	1	0	0	0	0
20 July	113	57	260	B3.0	2	0	0	3	0	0	0	0
21 July	109	49	320	B3.2	2	0	0	8	1	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2} -day -sr)			Electron Fluence (electrons/cm^2 -day -sr)		
	>1 MeV	>10 MeV	>100 MeV	>0.6 MeV	>2MeV	>4 MeV
15 July	1.3e+05	1.0e+04	2.5e+03		2.1e+07	
16 July	1.4e+05	1.0e+04	2.5e+03		6.4e+07	
17 July	1.6e+05	1.0e+04	2.7e+03		1.8e+08	
18 July	3.0e+05	1.1e+04	2.7e+03		8.1e+07	
19 July	5.0e+05	1.0e+04	2.6e+03		7.6e+07	
20 July	1.5e+06	1.1e+04	2.7e+03		1.9e+08	
21 July	1.5e+06	1.1e+04	2.5e+03		1.9e+08	

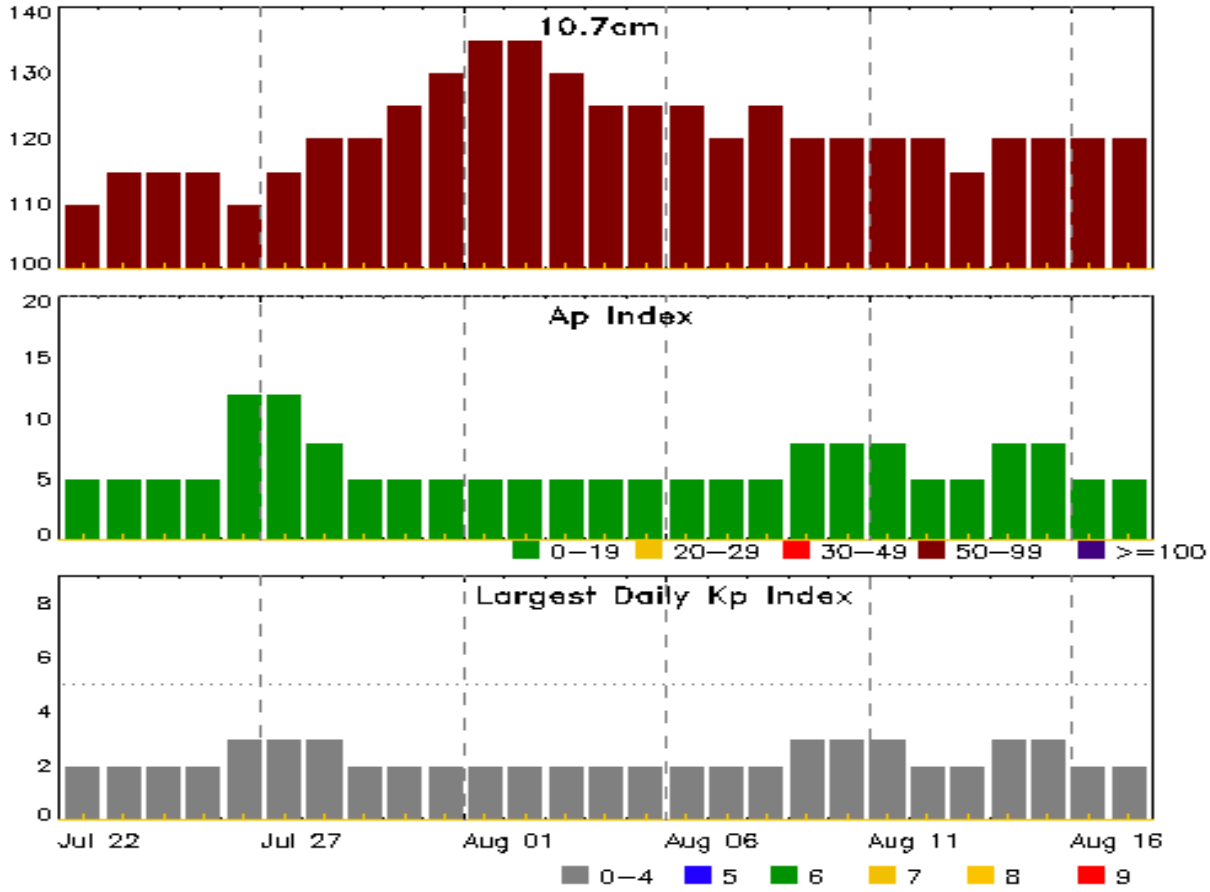
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
15 July	33	6-6-5-4-3-2-1-2	34	4-4-6-4-5-5-3-1	25	5-5-4-3-3-3-2-2
16 July	5	0-2-1-1-2-2-2-2	6	1-2-2-2-2-2-1-1	5	1-2-1-1-1-2-2-1
17 July	5	0-1-2-1-2-2-1-2	2	1-1-1-0-0-1-1-1	5	1-1-2-1-1-1-1-2
18 July	16	0-0-2-2-4-5-4-3	26	1-0-2-3-6-6-3-2	15	1-1-2-2-4-4-4-3
19 July	13	3-2-3-3-3-2-3-3	26	3-3-5-5-5-3-3-2	14	3-2-3-2-3-3-3-3
20 July	6	3-1-1-1-2-2-2-1	4	3-2-1-2-1-0-0-0	6	3-1-2-1-1-1-1-1
21 July	4	1-1-0-2-2-2-1-1	3	1-1-1-1-1-1-1-0	5	1-1-1-1-1-2-1-2

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
15 Jul 0029	WARNING: Geomagnetic K = 5	15/0030 - 0800
15 Jul 0047	EXTENDED WARNING: Geomagnetic K = 4	14/0215 - 15/1300
15 Jul 0110	ALERT: Geomagnetic K = 5	15/0108
15 Jul 0708	EXTENDED WARNING: Geomagnetic K = 5	15/0030 - 1300
15 Jul 0708	EXTENDED WARNING: Geomagnetic K = 4	14/0215 - 15/1900
15 Jul 1455	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	10/1655
16 Jul 1321	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	10/1655
17 Jul 0631	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	10/1655
17 Jul 1450	WATCH: Geomagnetic Storm Category G1 predicted	
18 Jul 0524	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	10/1655
18 Jul 1451	WARNING: Geomagnetic K = 4	18/1451 - 2100
18 Jul 1453	ALERT: Geomagnetic K = 4	18/1454
18 Jul 2044	EXTENDED WARNING: Geomagnetic K = 4	18/1451 - 19/1300
19 Jul 1256	EXTENDED WARNING: Geomagnetic K = 4	18/1451 - 20/1300
19 Jul 1301	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	10/1655
20 Jul 0501	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	10/1655
20 Jul 0540	CANCELLATION: Geomagnetic Storm Category G1 predicted	
21 Jul 0505	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	10/1655

Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
22 Jul	110	5	2	05 Aug	125	5	2
23	115	5	2	06	125	5	2
24	115	5	2	07	120	5	2
25	115	5	2	08	125	5	2
26	110	12	3	09	120	8	3
27	115	12	3	10	120	8	3
28	120	8	3	11	120	8	3
29	120	5	2	12	120	5	2
30	125	5	2	13	115	5	2
31	130	5	2	14	120	8	3
01 Aug	135	5	2	15	120	8	3
02	135	5	2	16	120	5	2
03	130	5	2	17	120	5	2
04	125	5	2				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV

No Events Observed

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
15 Jul	0233	0257	0303	C1.1			1792
15 Jul	0311	0344	0408	C3.0	SF	S13E19	1791
15 Jul	0419	0421	0423		SF	S13E16	1791
15 Jul	0424	0424	0441		SF	S13E16	1791
15 Jul	0622	0633	0654		SF	S12E18	1791
15 Jul	0708	0716	0718		SF	N11W62	1794
15 Jul	0726	0733	0740	C1.7			1793
15 Jul	0806	0808	0812		SF	S12E18	1791
15 Jul	0828	0830	0832		SF	N12W63	1794
15 Jul	1028	U1033	A1154	C3.6	SF	S12E16	1791
15 Jul	B1201	U1208	A1217		SF	S12E15	1791
15 Jul	1655	1700	1703	C1.0	SF	S12E15	1791
16 Jul	0059	0110	0115	C2.1	SF	S13E09	1791
16 Jul	0851	0853	0900		SF	S12E04	1791
16 Jul	1010	1016	1021	C1.9	SF	S12E04	1791
16 Jul	2228	2233	2237	B5.7			1793
16 Jul	2324	2343	0005	B6.4			1791
17 Jul	0149	0221	0254	C1.1	SF	S13W05	1791
17 Jul	0239	0240	0246		SF	S13W05	1791
17 Jul	0500	0507	0524		SF	S12E04	1791
17 Jul	0559	0559	0601		SF	N22E47	1793
17 Jul	0912	0916	0919	C1.6			
17 Jul	1006	1010	1013	B5.8	SF	S13W10	1791
17 Jul	2101	2104	2107	B6.9			1793
18 Jul	1756	1823	1858	C2.3			1800
18 Jul	1957	2016	2032	C2.3			1800
19 Jul	2152	2159	2206	B9.8	SF	S17W46	1791
20 Jul	0334	0338	0344	C2.1	SF	N24E09	1793
20 Jul	0643	0643	0646		SF	N19E02	1793
20 Jul	1935	1935	1939		SF	N22E01	1793
20 Jul	2333	2338	2342	C1.0			1800

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
21 Jul	0258	0308	0310	C1.0	SF	S07E34	1800
21 Jul	0319	0329	0336		SF	S07E33	1800
21 Jul	0441	0444	0448		SF	S07E33	1800
21 Jul	0521	0525	0527	B5.7	SF	S07E32	1800
21 Jul	0640	0645	0649	B8.0	SF	N23W07	1793
21 Jul	0824	0844	0939	C3.1	1F	S06E31	1800
21 Jul	0827	0827	0831		SF	N23W09	1793
21 Jul	1215	1219	1224	B8.3	SF	N22W09	1793
21 Jul	1232	1234	1238		SF	N22W11	1793
21 Jul	1455	1459	1501	B6.2			1793

Region Summary

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 1787												
03 Jul	S14E70	348	60	7	Dso	3	B	4	1		6				
04 Jul	S14E56	349	160	9	Dao	12	BG	5			5	2			
05 Jul	S15E43	349	170	11	Eai	14	BG	9			19	3			
06 Jul	S14E31	348	140	10	Dao	17	BG				5				
07 Jul	S14E17	349	140	11	Eai	19	BG								
08 Jul	S14E03	348	200	11	Eac	34	BGD								
09 Jul	S15W09	348	230	11	Eai	23	BG	1			2				
10 Jul	S12W24	350	120	11	Eai	17	BG	2			2	1			
11 Jul	S15W36	348	100	11	Esi	14	BG								
12 Jul	S13W49	348	90	11	Eao	14	BG	1			1				
13 Jul	S14W63	349	90	11	Eao	10	BG								
14 Jul	S13W75	348	20	1	Hax	1	A								
15 Jul	S13W89	349	plage												
								23	1	0	40	6	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 348

			Region 1789												
07 Jul	S24E22	344	10	3	Bxo	2	B								
08 Jul	S25E09	342	10	6	Bxo	3	B								
09 Jul	S23W05	343	plage												
10 Jul	S23W19	345	plage								1				
11 Jul	S28W24	337	10	1	Axx	2	A								
12 Jul	S27W37	336	0		Axx	1	A								
13 Jul	S27W51	337	plage												
14 Jul	S27W65	338	plage												
15 Jul	S27W79	339	plage												
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 343

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 1790												
07 Jul	S15E45	321	10	2	Axx	2	A								
08 Jul	S15E30	322	plage												
09 Jul	S15E16	323	plage												
10 Jul	S15E02	324	plage												
11 Jul	S15W12	325	plage												
12 Jul	S15W26	325	plage												
13 Jul	S15W40	326	plage												
14 Jul	S15W54	327	plage												
15 Jul	S15W68	328	plage												
16 Jul	S15W82	329	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 324

			Region 1791												
12 Jul	S15E47	252	50	5	Dso	7	B				1				
13 Jul	S14E32	254	130	6	Dao	7	B	1			2				
14 Jul	S15E17	256	110	7	Dai	15	B				1				
15 Jul	S14E04	255	110	7	Dso	13	BGD	3			8				
16 Jul	S14W08	255	110	7	Dao	14	BD	2			3				
17 Jul	S14W21	254	90	6	Dao	15	BG	1			4				
18 Jul	S14W34	253	30	7	Cao	10	B								
19 Jul	S13W46	253	0	1	Axx	1	A				1				
20 Jul	S13W60	254	plage												
21 Jul	S13W74	254	plage												
								7	0	0	20	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 255

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 1792												
12 Jul	N05E55	243	10	4	Bxo	3	B								
13 Jul	N05E43	243	10	2	Bxo	3	B								
14 Jul	N04E29	244	10	2	Bxo	5	B								
15 Jul	N03E13	246	10	1	Axx	2	A	1							
16 Jul	N02E02	244	plage												
17 Jul	N02W13	246	plage												
18 Jul	N02W28	248	plage												
19 Jul	N02W43	250	plage												
20 Jul	N02W58	252	plage												
21 Jul	N02W73	253	plage												
								1	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 244

			Region 1793												
14 Jul	N19E74	206	150	6	Dho	3	B								
15 Jul	N21E62	198	210	11	Esi	6	BG	1							
16 Jul	N21E51	195	310	12	Esi	14	BG								
17 Jul	N21E37	196	310	14	Eho	11	BG				1				
18 Jul	N20E24	195	310	14	Eho	18	BG								
19 Jul	N21E12	195	280	13	Eho	17	BG								
20 Jul	N21W01	195	230	15	Eao	24	BG	1			3				
21 Jul	N21W15	195	240	16	Fso	18	BG				4				
								2	0	0	8	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 195

			Region 1794												
14 Jul	N13W57	330	10	4	Bxo	2	B								
15 Jul	N13W72	331	30	4	Dao	5	B				2				
16 Jul	N15W88	335	110	9	Dao	3	B								
								0	0	0	2	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 330

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 1795												
14 Jul	S06E64	209	10	3	Bxo	2	B								
15 Jul	S05E49	209	0	1	Axx	1	A								
16 Jul	S06E34	213	plage												
17 Jul	S06E19	214	plage												
18 Jul	S06E04	216	plage												
19 Jul	S06W10	217	plage												
20 Jul	S06W25	219	plage												
21 Jul	S06W40	220	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 216

			Region 1796												
17 Jul	S14W39	272	10	3	Bxo	4	B								
18 Jul	S12W53	272	40	4	Dso	6	B								
19 Jul	S13W67	274	10	1	Axx	1	A								
20 Jul	S13W81	275	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 272

			Region 1797												
17 Jul	S19E11	222	20	4	Cro	4	B								
18 Jul	S19W02	221	10	6	Bxo	4	B								
19 Jul	S19W14	221	10	5	Bxo	2	B								
20 Jul	S19W26	220	plage												
21 Jul	S19W40	220	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 221

			Region 1798												
18 Jul	S12E42	177	10	1	Bxo	2	B								
19 Jul	S12E28	179	10	1	Axx	1	A								
20 Jul	S12E14	180	10	1	Axx	1	A								
21 Jul	S12W00	180	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 180

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		Region 1799													
18 Jul	S18E58	161	10	1	Axx	1	A								
19 Jul	S17E48	159	0	1	Axx	1	A								
20 Jul	S17E34	160	plage												
21 Jul	S17E20	160	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 160

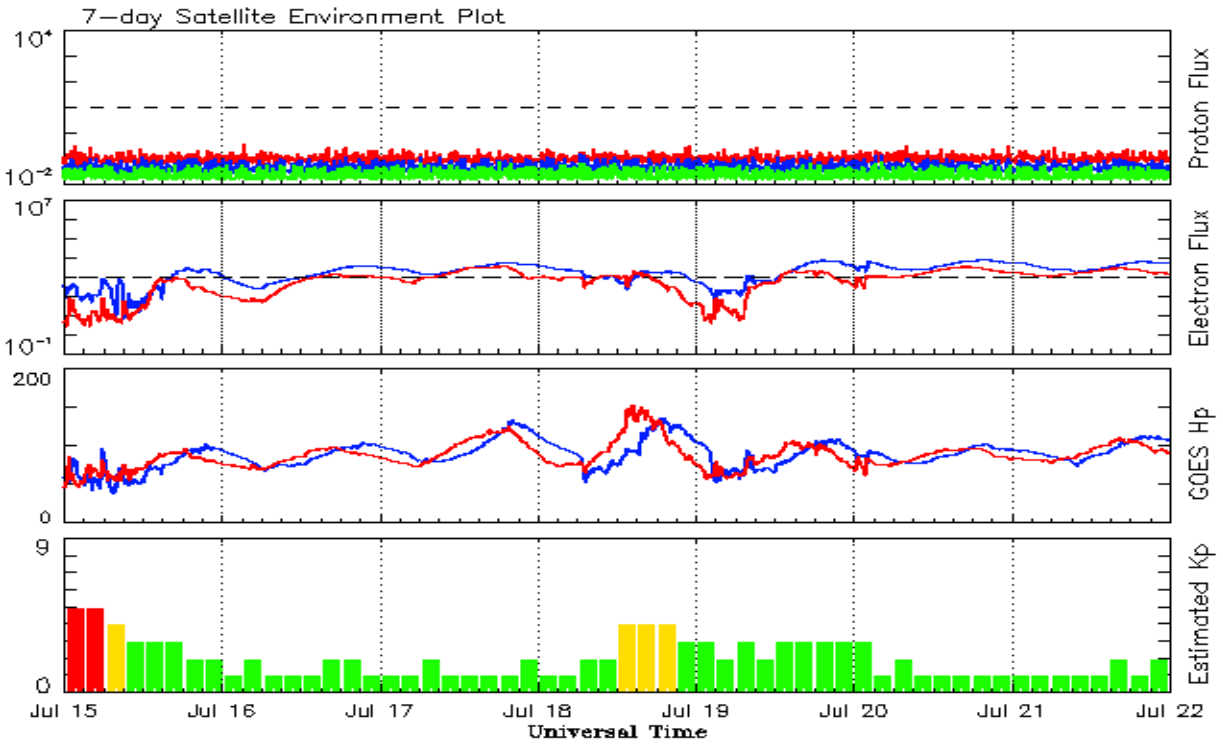
		Region 1800													
18 Jul	S10E63	156	30		Hax	1	A	2							
19 Jul	S10E51	156	20	1	Hrx	1	A								
20 Jul	S09E37	157	20	3	Cro	2	B	1							
21 Jul	S08E22	158	80	5	Dao	11	B	2			4	1			
								5	0	0	4	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 158

Recent Solar Indices (preliminary)
Observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2011					
July	67.0	43.8	0.66	82.5	57.3	94.2	115.4	9	7.3
August	66.1	50.6	0.77	84.9	59.0	101.7	117.9	8	7.4
September	106.4	78.0	0.73	84.6	59.5	134.5	118.4	13	7.7
October	116.8	88.0	0.75	84.6	59.9	137.2	118.4	7	8.0
November	133.1	96.7	0.73	86.3	61.1	153.1	119.5	3	8.0
December	106.3	73.0	0.69	89.2	63.4	141.2	121.6	3	8.0
				2012					
January	91.3	58.3	0.64	92.0	65.5	133.1	124.4	6	8.3
February	50.1	32.9	0.66	94.2	66.9	106.7	126.7	7	8.4
March	77.9	64.3	0.82	94.1	66.8	115.1	126.8	14	8.1
April	84.4	55.2	0.65	91.3	64.6	113.1	125.8	9	8.0
May	99.5	69.0	0.69	87.7	61.7	121.5	123.8	8	8.2
June	88.6	64.5	0.73	83.9	58.9	120.5	121.1	10	8.3
July	99.6	66.5	0.67	82.4	57.8	135.6	119.5	13	8.3
August	85.8	63.0	0.74	83.1	58.2	115.7	119.2	7	8.1
September	84.0	61.4	0.73	83.7	58.1	123.2	118.9	8	7.8
October	73.5	53.3	0.73	85.0	58.6	123.3	119.2	9	7.4
November	89.2	61.8	0.69	87.3	59.7	120.9	120.1	6	7.3
December	60.4	40.8	0.68	88.0	59.6	108.4	120.1	3	7.5
				2013					
January	99.8	62.9	0.63			127.1		4	
February	60.0	38.0	0.63			104.4		5	
March	81.0	57.9	0.71			111.2		9	
April	112.8	72.4	0.64			125.0		5	
May	125.5	78.7	0.63			131.3		10	
June	80.1	52.5	0.66			110.2		13	

Note: Values are final except for the most recent 6 months which are considered preliminary. Cycle 24 started in Dec 2008 with an RI=1.7.



Weekly Geosynchronous Satellite Environment Summary
Week Beginning 15 July 2013

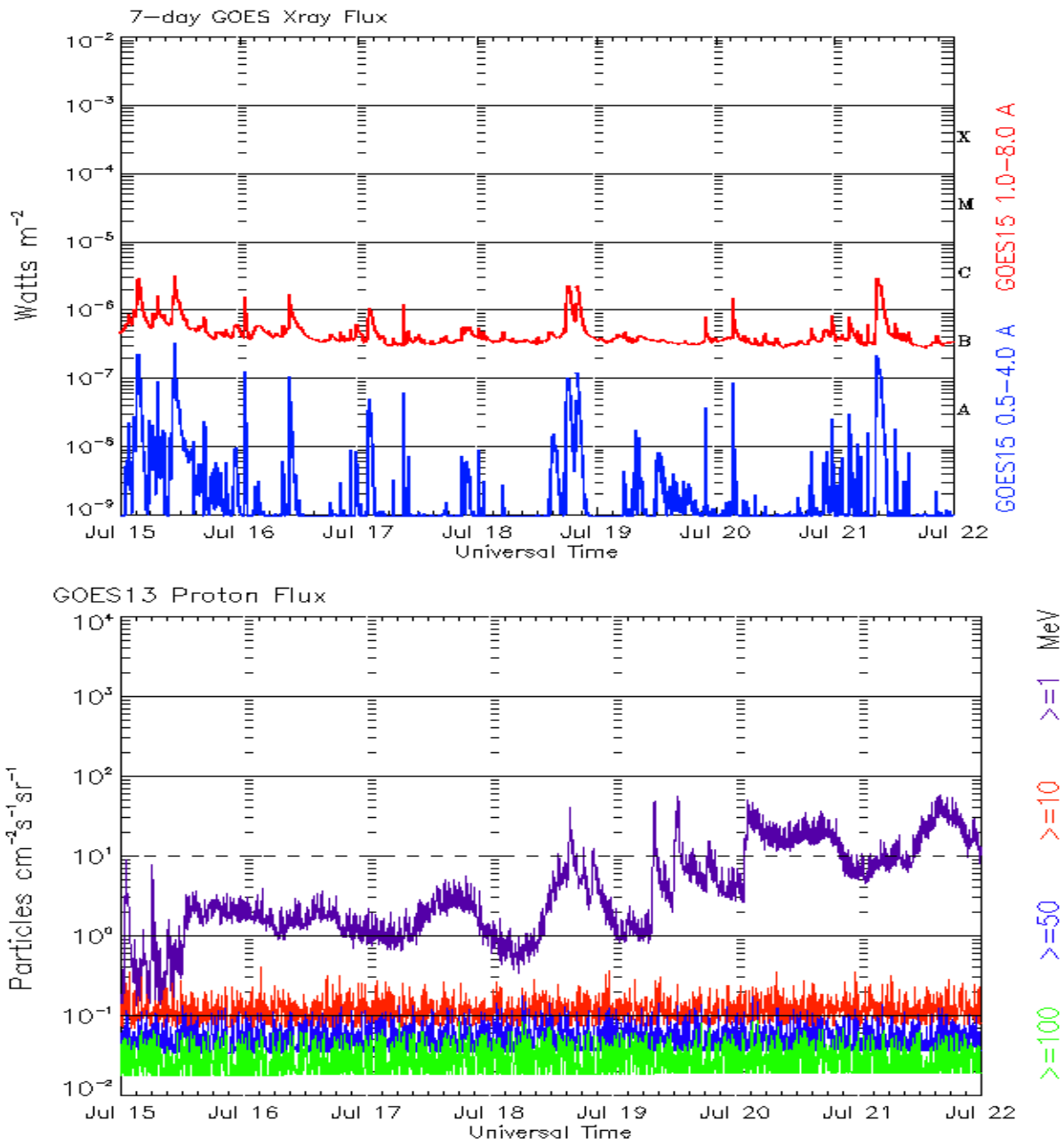
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm^2-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm^2-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

The data included here are those now available in real time at the SWPC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are 'global' parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



Weekly GOES Satellite X-ray and Proton Plots
Week Beginning 15 July 2013

The x-ray plots contains five-minute averages x-ray flux (Watt/m^2) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged intergral flux units (pfu = protons/cm^2 -sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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http://spaceweather.gov/SolarCycle/ -- Solar Cycle Progression web site

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http://spaceweather.gov/weekly/Usr_guide.pdf -- User Guide